# Build the Solar Theremin kit

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## TOOLS:

- Craft knife (1)
- Rosin-core solder (1)
- Scissors (1)
- Soldering iron (1)
- Third-hand tool (1)
  *aka helping hand*

## PARTS:

- Solar-Powered Theremin (Heliophone) Kit (1)
- Make project tin (1)

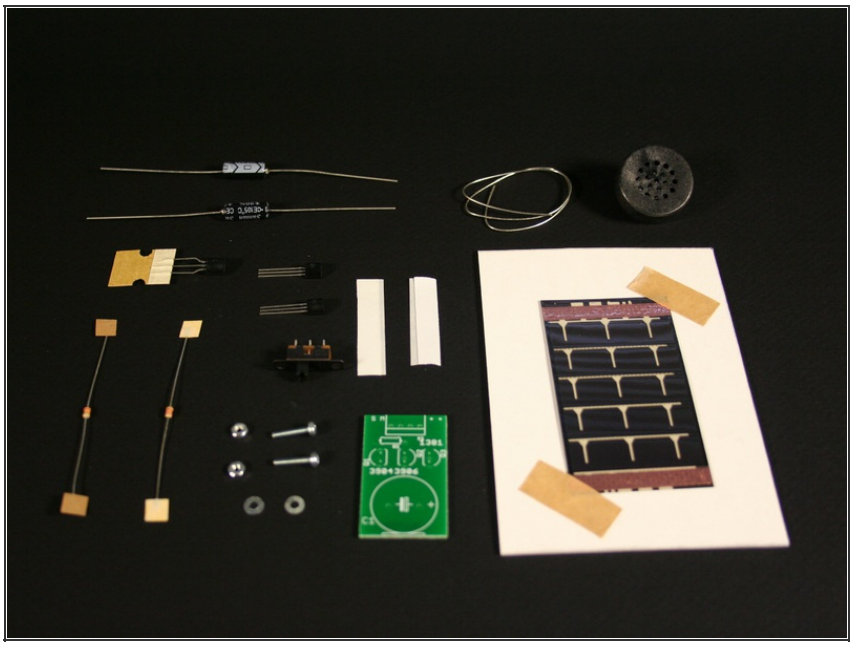
## SUMMARY

This is a really fun project for anyone interested in electronics or music. Best of all, it's inexpensive, easy to solder, and lots of fun.

You can pick up a kit in the Maker Shed.

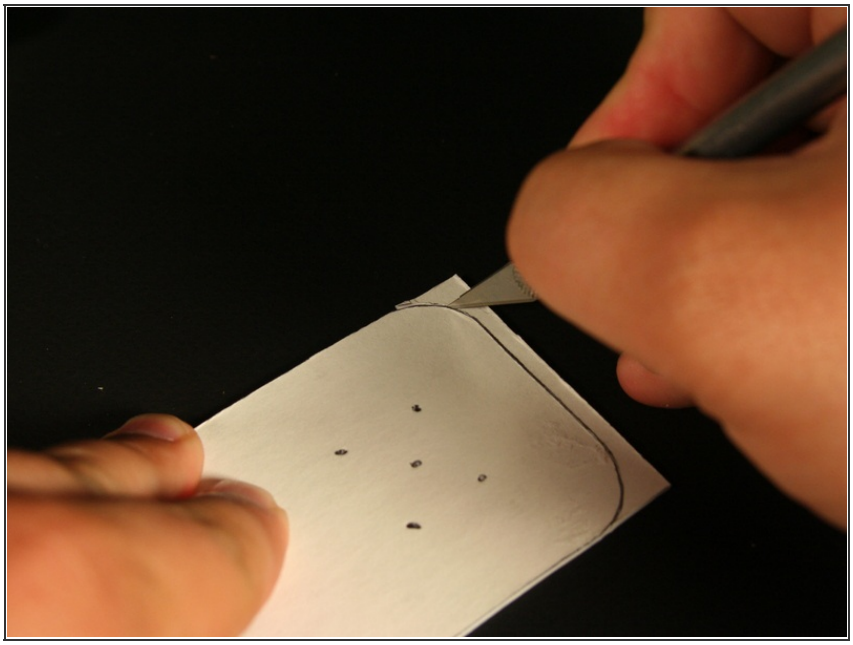
Make sure to watch my video demo and take a guess at what song I'm playing!

## Step 1 — Build the Solar Theremin kit



- Check your kit against the parts list
- Remember to get a mint tin to house the electronics, or pick up a Make Projects tin.

## Step 2

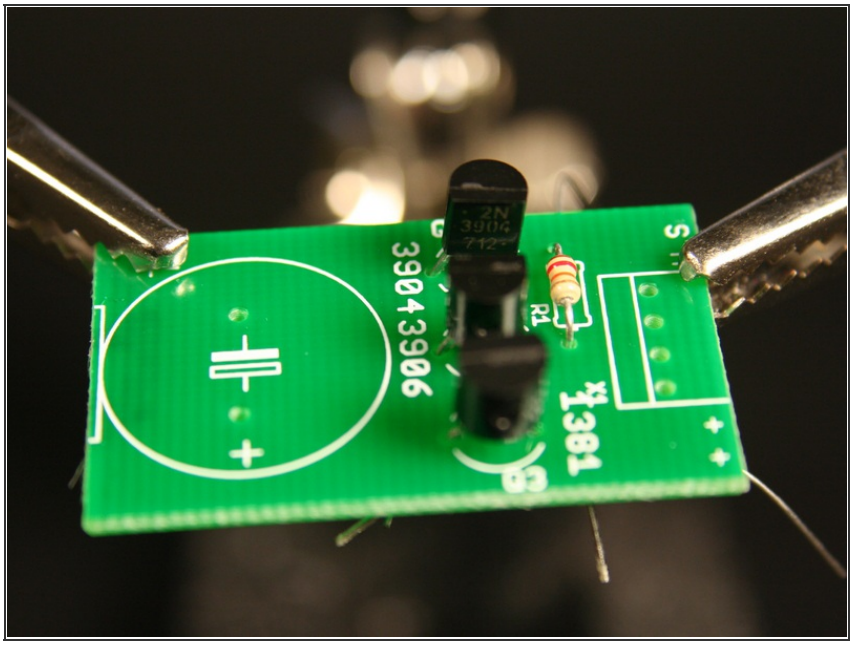


- The first step is to cut out the templates provided in the directions. I used the piece of cardboard that the solar panel was attached to for the Theremin's top.

## Step 3

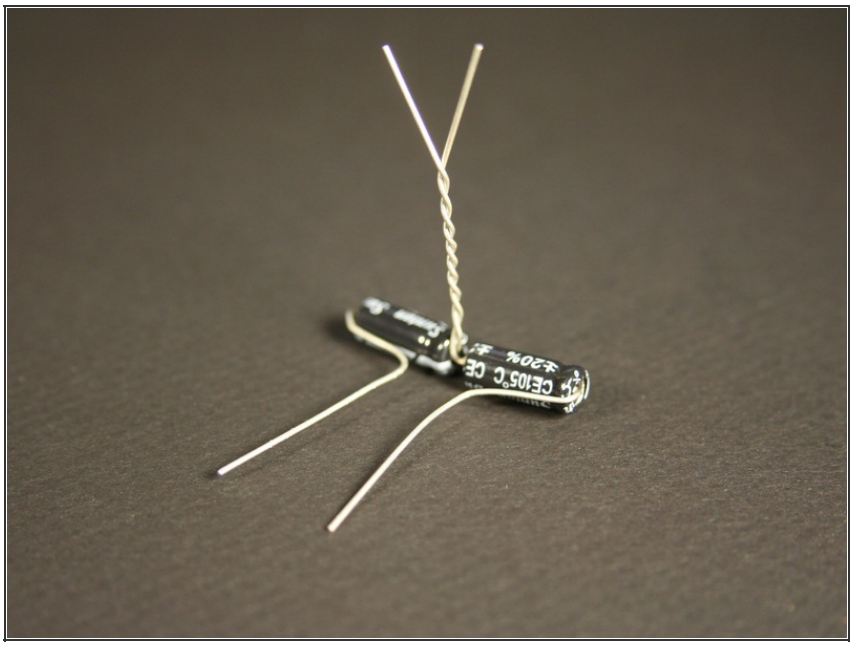
- Tape the bottom template in the tin. This will stop any of the electrical components from shorting out if they happen to touch the tin.
- Add the long cardboard strip around the interior edge of the tin.

## Step 4



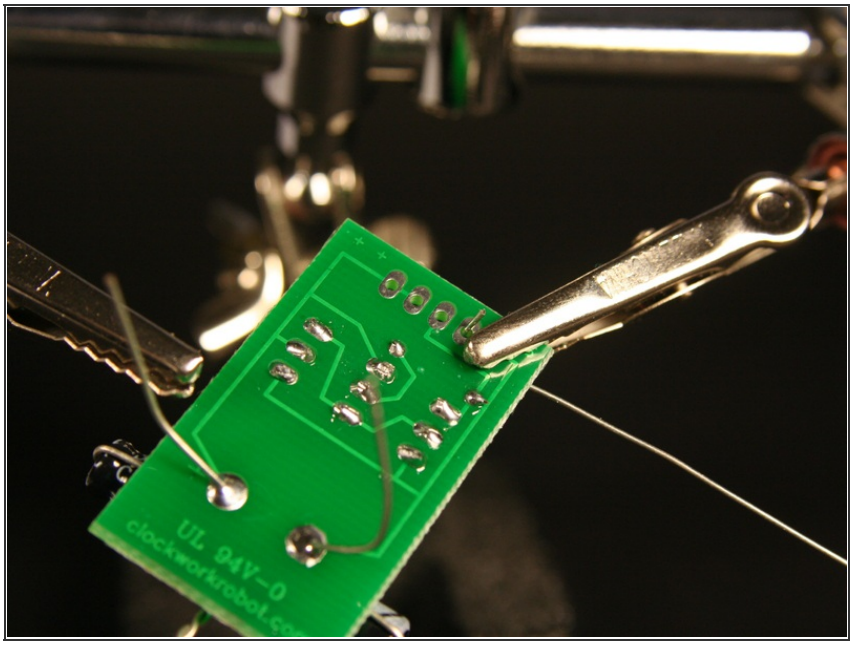

- Solder the 3 transistors and the 22K resistor.
- Make sure you insert the transistors according to the diagram or it will not work.

## Step 5



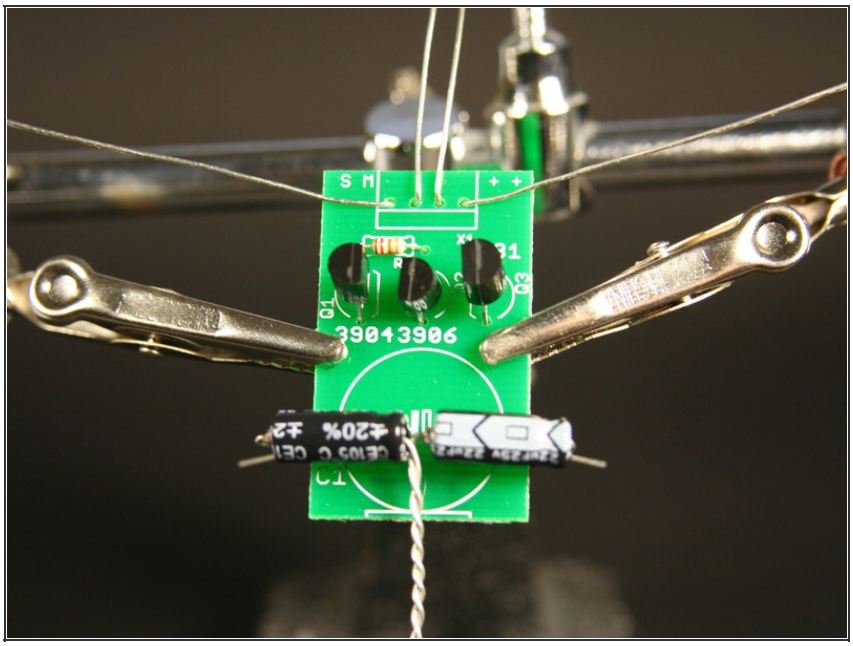
- You need to connect the (2) supplied capacitors together prior to soldering them.
- Make sure you connect them with the (+) and (-) ends together. The arrows on the capacitors, which happen to point to the negative lead, should be pointing from right to left when looking at the board.

## Step 6



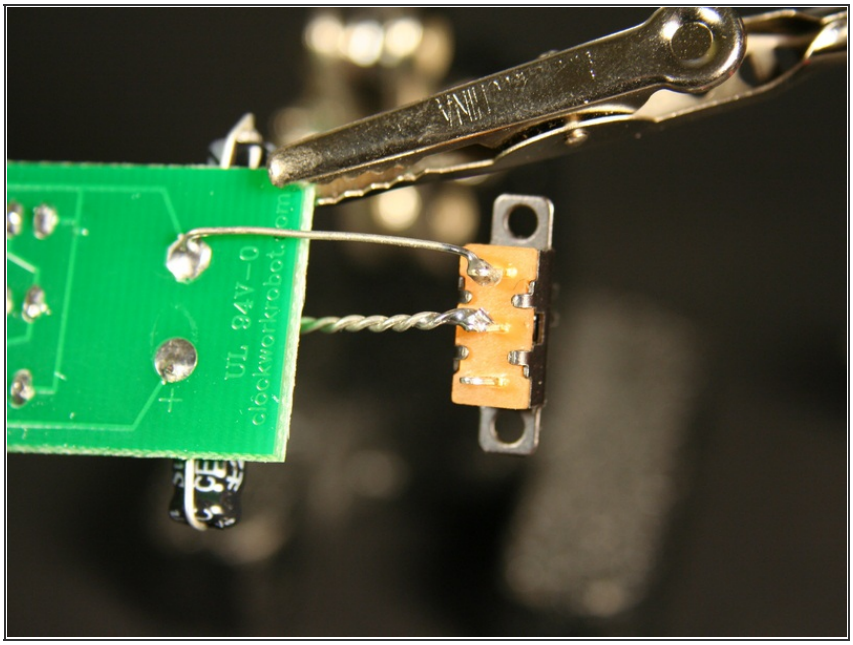

- Solder the capacitors to the board.
  - Don't clip the leads yet! You can cut the (+) lead, but the (-) lead will be soldered to the switch.

## Step 7



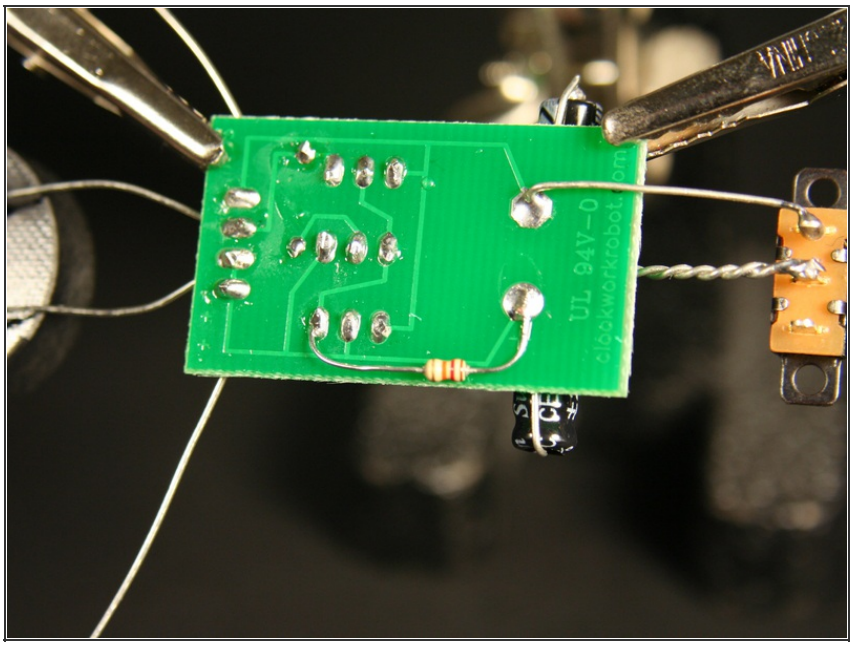

- Attach the pre-tinned copper wires to the board.
  - You can see them at the top of this picture.
  - I used the 3rd hand to hold them in place while soldering.
- The (2) 3cm wires go in the middle of the (2) 7cm wires.

## Step 8



- Solder the switch to the (-) side of the board and the twisted pair of wires from the capacitors.

## Step 9

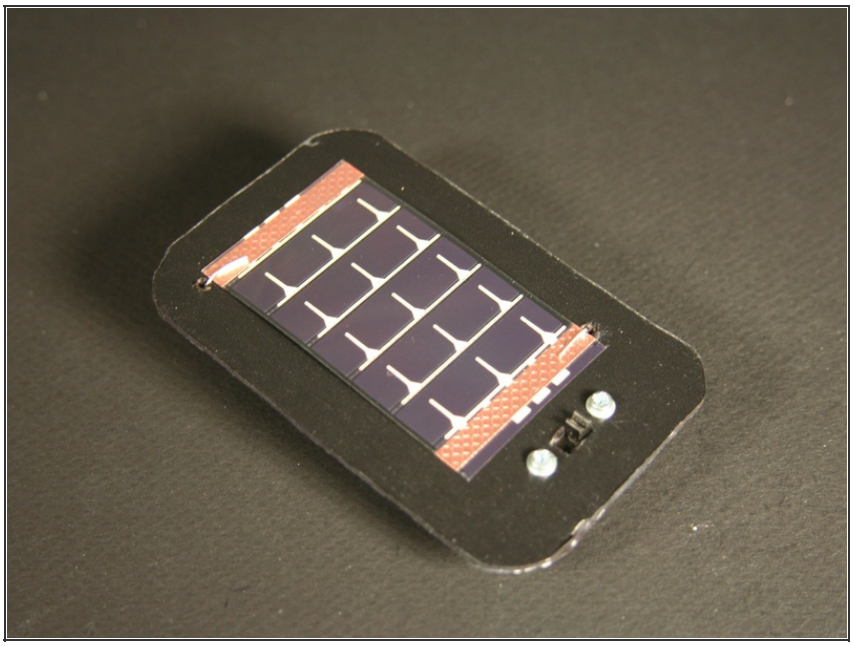


- Add the 12k resistor to the back of the board.
  - Make sure to read the included directions carefully and solder it in the right spot.
  - One end goes to the (+) side of the capacitors and the other goes to a trace on the board.

## Step 10

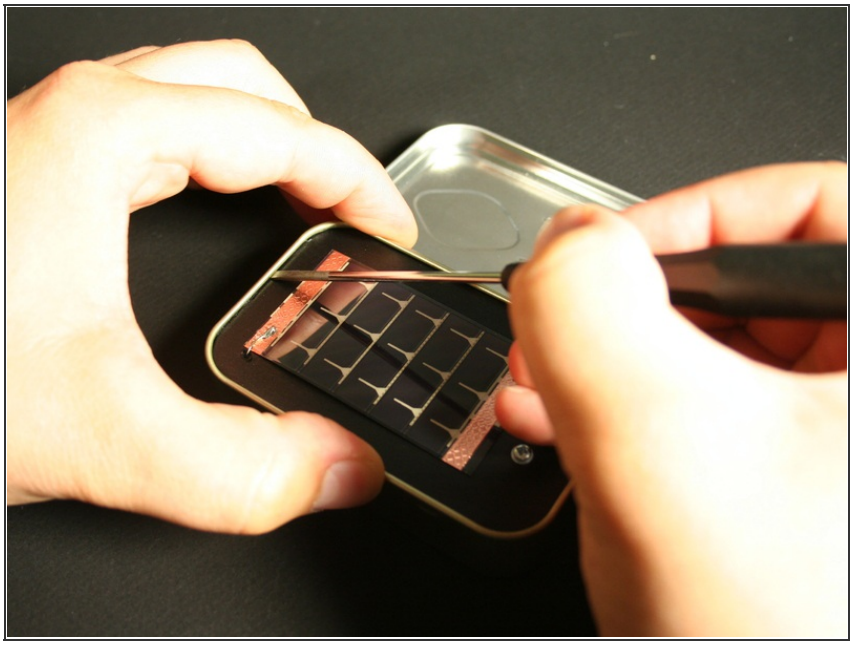
- It can be a bit tricky to solder the speaker. I found using the 3rd hand to hold the speaker in place and bending the (2) 3cm wires was the easiest way to solder them together.

## Step 11



- Screw the switch into the cardboard template that you cut out.
- Next, feed the (2) 7cm leads through the holes in the template.
- Now solder the solar panel to the copper tinned leads.
  - Make sure you orient the solar panel as described in the instructions.
- The panel can be tricky to solder; make sure you use enough heat.

## Step 12



- Push the whole assembly underneath the lip of the tin.
- The cardboard ring will hold it away from the bottom.
  - You might want to use a small screwdriver to slip the cardboard under the lip. It can be a bit tricky, but the template is a perfect fit.
- That's it! Take it outside and make some music.
- Make sure to watch my video demo too!

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